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SELF-ALIGNED NEAR SURFACE STRAP FOR HIGH DENSITY

TRENCH DRAMS

ABSTRACT

A method and structure for a dynamic random access memory device
5 comprising a storage trench, a storage conductor within the storage trench, a lip
strap connected to the storage conductor, and a control device electrically
connected to the storage conductor through the lip strap. The trench contains a
corner adjacent the control device and the lip strap and has a conductor
surrounding the corner. The control device has a control device conductive region
10 adjacent the trench and the lip strap and has a conductor extending along a side of
the trench and along a portion of the control device conductive region. In
addition, the device can have a collar insulator along a top portion of the trench,
wherein the lip strap includes a conductor extending from a top of the collar to a
top of the trench. The lip strap can also extend along a surface of the device
15 adjacent the trench and perpendicular to the trench. A node dielectric, lining the
trench where the lip strap surrounds an upper portion of the node dielectric, is
adjacent the top portion of the trench and can have a trench top oxide where the
lip strap extends into the trench top oxide and forms an inverted U-shaped
structure. Further, the lip strap can include a conductor extending along two
20 perpendicular portions of a top corner of the trench.